

Cms
AMENDMENTS TO THE SPECIFICATION

Please cancel pending claims 1-22 without prejudice and insert the following new claims 23-53:

23. (New) A method of controlling fluid flow in a boundary layer at a fluid-surface interface comprising: providing a plurality of blades which project from a fluid contacting surface into a boundary layer such that in use said blades are orientated to control fluid flow in said boundary layer.
24. (New) A method according to claim 23, wherein said blades are orientated to straighten said fluid flow.
25. (New) A method according to claim 23 wherein said blades are orientated generally aligned with the direction of fluid flow to straighten said fluid flow.
26. (New) A method according to claim 23 wherein said blades are orientated to reduce the drag or surface friction at said fluid contacting surface.
27. (New) A method according to claim 23 wherein said blades are orientated to induce turbulence or vortexes in said fluid flow.
28. (New) A method according to claim 23 wherein said blades are orientated at an angle across the direction of said fluid flow to induce turbulence or vortexes in said fluid flow.
29. (New) A method according to claim 23 in which said fluid contacting surface is that of a vehicle or fluid carrying conduit.
30. (New) A boundary layer flow control apparatus comprising: a surface, over which fluid can flow in a boundary layer, and a plurality of blades projecting from the surface, said blades being configured such that in use they are capable of controlling said flow of fluid within said boundary layer.

31. (New) A boundary layer flow control apparatus according to claim 30 in which, said blades are aligned with the expected direction of said fluid flow, and in use are capable of straightening said fluid flow in said boundary layer, thereby reducing surface friction or drag in comparison with the same surface without flow control apparatus.

32. (New) A boundary layer flow control apparatus according to claim 30 in which said blades are orientated at an angle across the expected direction of said fluid flow, and are capable of inducing turbulence or vortexes in said fluid flow in said boundary layer in use, thereby increasing surface friction or drag in comparison with the same surface without flow control apparatus.

33. (New) A method of controlling fluid flow according to claim 23, in which said blades are mounted extending substantially directly away from said surface.

34. (New) A boundary layer flow control apparatus according to claim 30, in which said blades are mounted extending substantially directly away from said surface.

35. (New) A method of controlling fluid flow according to claim 23, in which said blades are selected from the group consisting of: (a) configured as flat plate elements; (b) generally rectangular; (c) generally parallel; (d) generally of uniform height; (e) generally of uniform width; (f) generally of uniform chord; (g) generally of uniform spacing; (h) generally of uniform orientation; (i) generally uniform dimensions; and (j) dimensions vary across a surface.

36. (New) A boundary layer flow control apparatus according to claim 30, in which said blades are selected from the group consisting of: (a) configured as flat plate elements; (b) generally rectangular; (c) generally parallel; (d) generally of uniform height; (e) generally of uniform width; (f) generally of uniform chord; (g) generally of uniform spacing; (h) generally of uniform orientation; (i) generally uniform dimensions; and (j) dimensions vary across a surface.

37. (New) A method of controlling fluid flow according to claim 23, in which said blades project into said boundary layer by 100 to 200 wall units.

38. (New) A boundary layer flow control apparatus according to claim 30, in which said blades project into said boundary layer by 100 to 200 wall units.

39. (New) A method of controlling fluid flow according to claim 23, in which said blade orientation can be adjusted relative to the direction of fluid flow.

40. (New) A boundary layer flow control apparatus according to claim 30, in which said blade orientation can be adjusted relative to the direction of fluid flow.

41. (New) A method of controlling fluid flow according to claim 23, in which said blades are arranged as an array of multiple repeated rows.

42. (New) A boundary layer flow control apparatus according to claim 30, in which said blades are arranged as an array of multiple repeated rows.

43. (New) A method of controlling fluid flow according to claim 23, in which said blades have a height, width and chord ratio of X:Y:Z wherein X is between 1 and 6, Y is between 1 and 6 and Z is between 1 and 6.

44. (New) A boundary layer flow control apparatus according to claim 30, in which said blades have a height, width and chord ratio of X:Y:Z wherein X is between 1 and 6, Y is between 1 and 6 and Z is between 1 and 6.

45. (New) A method of controlling fluid flow according to claim 29 in which at least a 2% improvement in one or more selected from the group consisting of:

- a) reduction of surface drag;
- b) reduction of noise levels;
- c) reduction of fuel consumption; and
- d) increased speed;

is observed compared to a vehicle, including an aircraft, without said flow manipulator blades projecting from said fluid contacting surface.

46. (New) A method of controlling fluid flow according to claim 29 in which at least a 5% improvement in one or more selected from the group consisting of:

- a) reduction of surface drag;
- b) reduction of noise levels;
- c) reduction of fuel consumption; and
- d) increased speed;

is observed compared to a vehicle, including an aircraft, without said flow manipulator blades projecting from said fluid contacting surface.

47. (New) A method of controlling fluid flow according to claim 29 in which at least a 10% improvement in one or more selected from the group consisting of:

- e) reduction of surface drag;
- f) reduction of noise levels;
- g) reduction of fuel consumption; and
- h) increased speed;

is observed compared to a vehicle, including an aircraft, without said flow manipulator blades projecting from said fluid contacting surface.\

48. (New) A method of controlling fluid flow according to claim 29 in which at least a 15% improvement in one or more selected from the group consisting of:

- i) reduction of surface drag;
- j) reduction of noise levels;
- k) reduction of fuel consumption; and
- l) increased speed;

is observed compared to a vehicle, including an aircraft, without said flow manipulator blades projecting from said fluid contacting surface.

49. (New) A surface upon which is mounted a boundary layer flow control apparatus according to claim 30.
50. (New) An aircraft, with body, wing and tail sections, with boundary layer flow control apparatus as claimed in claim 30 mounted upon the body, wing and/or tail section.
51. (New) A pipe with an internal surface upon which is mounted boundary layer flow control apparatus as claimed in claim 30.
52. (New) A method of reducing the surface drag of an aircraft having an outer surface skin comprising affixing a large number, preferably at least five hundred, of flow manipulator control blades to the surface skin, said blades being aligned with the expected direction of fluid flow past said aircraft skin.
53. (New) A method of reducing the surface drag in a pipe or conduit having an inner surface comprising affixing flow manipulator control blades to said inner surface, said blades being aligned with the expected direction of fluid flow past the surface.